

CLAIMS:

1 (Original). An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

a housing having a first surface and a second surface, wherein the first surface comprises an electrically insulated material and the second surface comprises an electrically conductive material; and

an electrical circuit located within the housing, wherein the electrical circuit is electrically coupled to the second surface of the housing.

2 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a ceramic material.

3 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a titanium alloy.

4 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a stainless steel alloy.

5 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a polymeric material.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

6 (Original). The implantable cardioverter-defibrillator of claim 5, wherein the plastic material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

a 7 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the first surface is pliable.

8 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the housing comprises a material that can be sterilized.

9 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the second surface can emit an energy for shocking the patient's heart.

10 (Original). The implantable cardioverter-defibrillator of claim 9, wherein the second surface can further receive sensory information.

11 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the second surface can receive sensory information.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

12 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide a cardioversion-defibrillation energy to the patient's heart.

13 (Original). The implantable cardioverter-defibrillator of claim 12, wherein the electrical circuit can further provide multiphasic waveform cardiac pacing for the patient's heart.

14 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide multiphasic waveform cardiac pacing for the patient's heart.

15 (Original). The implantable cardioverter-defibrillator of claim 14, wherein the electrical circuit can provide biphasic waveform cardiac pacing for the patient's heart.

16 (Original). The implantable cardioverter-defibrillator of claim 14, wherein the electrical circuit can provide triphasic waveform cardiac pacing for the patient's heart.

17 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide a monophasic waveform cardiac pacing for the patient's heart.

18 (Original). The implantable cardioverter-defibrillator of claim 1, wherein the housing further comprises a connection port that electrically couples to the electrical circuit.

19 (Original). The implantable cardioverter-defibrillator of claim 18, wherein the connection port is further coupled to a lead.

a 20 (Original). The implantable cardioverter-defibrillator of claim 19, wherein the lead is a pacing lead.

21 (Original). The implantable cardioverter-defibrillator of claim 19, wherein the lead is a shocking lead.

22 (Original). The implantable cardioverter-defibrillator of claim 19, wherein the lead is a sensory lead.

23 (Original). A subcutaneous cardioverter-defibrillator comprising:
a housing having a proximal end and a distal end, wherein at least a portion of the housing is electrically insulated;
a cardioversion-defibrillation circuitry sealed within the housing, wherein the cardioversion-defibrillation circuitry can provide an anti-arrhythmia waveform; and

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

an electrically conductive surface disposed upon a portion of the housing, wherein the electrically conductive surface couples to the cardioversion-defibrillation circuitry, and further wherein the electrically conductive surface can provide a cardioversion energy of approximately 5 V/cm to approximately 90 percent of a patient's myocardium.

a 24 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing is pliable.

b 25 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing comprises a material that can be sterilized.

26 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the length between the proximal end of the housing and the distal end of the housing is approximately 3 centimeters to approximately 30 centimeters.

27 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the proximal end of the housing and the distal end of the housing are substantially square.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

28 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the distal end of the housing is rounded.

29 (Original). The subcutaneous cardioverter-defibrillator of claim 28, wherein the proximal end of the housing is rounded.

a1 30 (Original). The subcutaneous cardioverter-defibrillator of claim 28, wherein the proximal end of the housing is substantially square.

31 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing is approximately 1 centimeter to approximately 10 centimeters.

32 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing is approximately 2 centimeters to approximately 5 centimeters.

33 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing tapers inwardly from the proximal end of the housing to the distal end of the housing.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

34 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the depth of the housing decreases from the proximal end of the housing to the distal end of the housing.

35 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the electrically conductive surface may additionally receive sensory information.

a1 36 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a multiphasic waveform for cardiac pacing of a patient's heart.

37 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a biphasic waveform for cardiac pacing of a patient's heart.

38 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a triphasic waveform for cardiac pacing of a patient's heart.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

39 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a monophasic waveform for cardiac pacing of a patient's heart.

40 (Original). The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing further comprises a connection port that electrically couples to the cardioversion-defibrillation circuitry.

41 (Original). The subcutaneous cardioverter-defibrillator of claim 40, wherein the connection port is further coupled to a lead.

42 (Original). The subcutaneous cardioverter-defibrillator of claim 41, wherein the lead is a pacing lead.

Cancel claims 43-82.

83 (New). An implantable cardioverter-defibrillator for subcutaneous positioning comprising:

a housing having a proximal housing segment and a distal housing segment, said housing segments being elongated and coupled to each other at two respective end; and

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

an electrical circuit located within the housing, wherein the electrical circuit is electrically coupled to the housing.

Sub
B1
A1
84 (New). The implantable cardioverter-defibrillator of claim 83, said housing being adapted to be positioned between said third and twelfth rib of a patient.

85 (New). The implantable cardioverter-defibrillator of claim 83 wherein said housing segments are hinged to each other.

86 (New). The implantable cardioverter-defibrillator of claim 83 further comprising an electrode formed on said housing, said electrical circuit being connected to said electrode.

87 (New). The implantable cardioverter-defibrillator of claim 86 wherein said electrode and said electrical circuit are disposed within said distal housing segment.

88 (New). The implantable cardioverter-defibrillator of claim 86 wherein said electrode is disposed on said distal housing segment and said electrical circuit is disposed within said proximal housing segment.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

89 (New). The implantable cardioverter-defibrillator of claim 83 where said housing is curved to mimic the anatomical shape of patient's ribcage.

Sub
B1
a1
90 (New). The implantable cardioverter-defibrillator of claim 83 wherein said distal housing segment has a top surface and a bottom surface, said top and bottom surfaces being curved.

91 (New). The implantable cardioverter-defibrillator of claim 83 wherein said distal housing segment has a top surface and a bottom surface, said top surface being tapered toward said bottom surface.

92 (New). The implantable cardioverter-defibrillator of claim 83 wherein said proximal housing segment has a top surface and a bottom surface, said top and bottom surfaces being curved.

93 (New). The implantable cardioverter-defibrillator of claim 83 said housing segments have curved top and bottom surfaces.

94 (New). The implantable cardioverter-defibrillator of claim 83 said distal housing segment has curved top and bottom surfaces and said proximal housing segment has planar top and bottom surfaces.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

95 (New). A cardioverter-defibrillator for subcutaneous implantation, the cardioverter-defibrillator comprising:

Sub
B1
A1
a housing having a length, a width and a depth, wherein the depth of the housing is less than approximately 15 millimeters, the housing further including a proximal and a distal segment, said segments having generally elongated shapes and placed in an end-to-end configuration and coupled to each other;

an electrical circuit disposed within the housing, wherein the electrical circuit can provide cardioversion-defibrillation and cardiac pacing for a patient's heart; and

an electrode located on the housing, wherein the electrode is electrically coupled to the electrical circuit.

96 (New). The implantable cardioverter-defibrillator of claim 95, said housing being adapted to be positioned between said third and twelfth rib of a patient.

97 (New). The implantable cardioverter-defibrillator of claim 95 wherein said housing segments are hinged to each other.

98 (New). The implantable cardioverter-defibrillator of claim 95 where said housing is curved to mimic the anatomical shape of patient's ribcage.

99 (New). The implantable cardioverter-defibrillator of claim 95 wherein said

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

Sub
B1
a1
distal segment has a top surface and a bottom surface, said top and bottom surfaces being curved.

100 (New). The implantable cardioverter-defibrillator of claim 95 wherein said distal segment has a top surface and a bottom surface, said top surface being tapered toward said bottom surface.

101 (New). The implantable cardioverter-defibrillator of claim 95 wherein said proximal segment has a top surface and a bottom surface, said top and bottom surfaces being curved.

102 (New). The implantable cardioverter-defibrillator of claim 95 said segments have curved top and bottom surfaces.

103 (New). The implantable cardioverter-defibrillator of claim 95 said distal segment has curved top and bottom surfaces and said proximal segment has planar top and bottom surfaces.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

Sub
B1
A1

104 (New). An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

a housing, wherein at least a portion of the housing is curved, said housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device;

an electrical circuit; and

at least one electrically conductive surface integrally positioned on at least one portion of the housing, wherein the at least one electrically conductive surface is coupled to the electrical circuit.

105 (New). The implantable cardioverter-defibrillator of claim 104, wherein the housing comprises an electrically insulated material.

106 (New) The implantable cardioverter-defibrillator of claim 104, wherein the housing is pliable.

107 (New). The implantable cardioverter-defibrillator of claim 104, wherein the housing comprises a material that can be sterilized.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

108 (New). The implantable cardioverter-defibrillator of claim 104, wherein the housing comprises a ceramic material.

Sub
B1
A1
109 (New). The implantable cardioverter-defibrillator of claim 108, wherein the ceramic material is selected from the group consisting essentially of zirconia, alumina, silicon nitride, silicon carbide, titanium carbide, tungsten carbide, titanium nitride, silicon-aluminum oxy-nitride (sialon), graphite, titanium di-boride, boron carbide, zirconia toughened alumina, and molybdenum disilicide.

110 (New). The implantable cardioverter-defibrillator of claim 109, wherein the zirconia is selected from the group consisting essentially of stabilized zirconia, partially stabilized zirconia, tetragonal zirconia, yttria-stabilized zirconia, magnesia-stabilized zirconia, ceria-stabilized zirconia, and calcia-stabilized zirconia.

111 (New). The implantable cardioverter-defibrillator of claim 104, wherein the housing comprises a mixture of ceramic materials and titanium.

112 (New). The implantable cardioverter-defibrillator of claim 104 wherein at least a portion of the first segment is curved.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

Sub
B1
a1
113 (New). The implantable cardioverter-defibrillator of claim 104, further wherein at least a portion of the second segment is curved.

114 (New). The implantable cardioverter-defibrillator of claim 104, wherein the curved portion of the housing comprises a circular arc.

115 (New). The implantable cardioverter-defibrillator of claim 104, wherein the curved portion of the housing comprises an elliptical arc.

116 (New). The implantable cardioverter-defibrillator of claim 104, wherein the curved portion of the housing comprises a nonsymmetrical arc.

117 (New). The implantable cardioverter-defibrillator of claim 104, wherein the second segment comprises a circular arc.

118 (New). The implantable cardioverter-defibrillator of claim 104, wherein the second segment comprises an elliptical arc.

119 (New). The implantable cardioverter-defibrillator of claim 104, wherein the second segment comprises a nonsymmetrical arc.

Appl. No. 09/940,599
Amdt. dated October 29, 2003
Reply to Office Action of August 29, 2003

Sub B1
120 (New). The implantable cardioverter-defibrillator of claim 104, wherein the second segment of the housing is substantially straight.

*Al
conced*
121 (New). The implantable cardioverter-defibrillator of claim 104, wherein the first segment of the housing is contiguous with the second segment of the housing.

122 (New). The implantable cardioverter-defibrillator of claim 104, wherein a hinge couples the first segment of the housing to the second segment of the housing.